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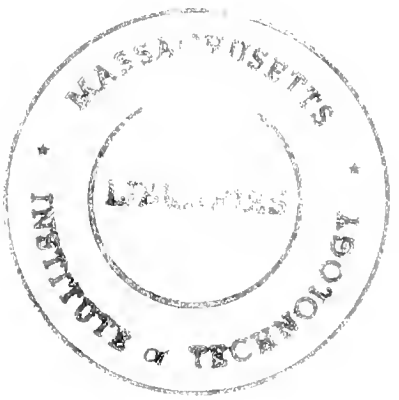
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THE MARKET SHARE -- PROFITABILITY RELATIONSHIP: TESTING TEMPORAL STABILITY ACROSS BUSINESS CYCLES

N. Venkatraman
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The Market Share -- Profitability Relationship: Testing Temporal Stability Across Business Cycles

Summary

Several studies have demonstrated a generally positive association between market share (MS) and business profitability (BP), and that this relationship is dependent on the environmental and strategic contexts, but the stability of such results across distinct time-periods representing differing business cycles has not yet been demonstrated. This paper, employing a comparative static methodology, assesses the stability of the nature of the relationships among strategic resource deployments, market share position and profitability across two different time periods representing significantly different macroeconomic conditions. The results indicate that the general level of association (i. e. , correlation) between MS and BP is stable, but the set of significant strategic factors contributing to both MS and BP is different, indicating variations in strategies for the two different cycles. Some explanations for the observed differences as well as limited generalizations on the market share--profitability relationships are developed.

INTRODUCTION

The nature of the relationship between market share (MS) and business profitability (BP) continues to be a subject of importance to researchers in economics, marketing and strategic management. While the early studies (Buzzell, Gale, and Sultan, 1975; Schoeffler, Buzzell, and Heany, 1974) reported a generally positive association between MS and BP, the later studies have attempted to model the nature of this relationship against the backdrop of environmental and strategy variables (Jacobson, 1988; Jacobson and Aaker, 1985; Phillips, Chang, and Buzzell, 1983; Prescott, Kohli, and Venkatraman, 1986; Rumelt and Wensley, 1981; Woo, 1987). Specifically, two recent shifts are noteworthy: One, efforts at decomposing the observed correlation between MS and BP into *direct* and *spurious* (i. e. , accounted for by a set of antecedent strategy variables) effects (Prescott et. al. , 1986; Woo, 1987); as well as *direct* and *indirect* (i. e. , due to the impact of market share on the price-cost relationship) effects (Phillips, Chang, and Buzzell, 1983). The other is to identify the lagged effects of market share on profitability (Jacobson and Aaker, 1985; Jacobson, 1988; Anterasian and Phillips, 1988).

However, it is striking that most studies have focused their efforts on a single time-period. Researchers have either pooled data across consecutive years to smooth out the effects of non-recurring influences (Prescott et. al, 1986) or have treated data from adjacent time periods as distinct data points for model estimation (Jacobson, 1988; Phillips et. al. , 1983). While such practices may be appropriate for the particular research objectives pursued, a salient question relates to the *stability* of the results across different time-periods, especially when they may reflect significant differences in macroeconomic conditions. Thus, while the context-specificity and the direct, indirect, and spurious nature of MS--BP relationship have been previously explored (Prescott et al. , 1986; Phillips et. al. , 1983; Woo, 1987), the temporal-sensitivity of the results across differing business cycles has not been explored. The purpose of this research is to test the stability of MS--BP relationships across two distinct time periods that represent significantly different business cycles.

BACKGROUND

Arguments from macroeconomic theory

Business cycles represent an important construct in macroeconomic research, but has not been well integrated into strategic management research (Mascarenhas and Aaker, in press). Typically specified with reference to changes in real gross national product (GNP), business cycles have largely been defined as sequential expansion and contractions in aggregate economic activity (Bogan and Kiernan, 1987). In recent years, there has been renewed interest in the study of business cycles. One thrust has focused on the measurement and modeling of business cycles (Gabisch and Lorenz, 1987), and a second stream has explored the impact of business cycles on market structure and price-cost margins (Domowitz, Hubbard, and Peterson, 1988; Frantzen, 1986). While each of the two themes discuss business level decisions, such as investments in plant and equipment, inventory levels, dividend policy, wage rates and capacity utilization, their primary unit of analysis is either an economy (or, sectors) or an industry. There has been negligible attention to the implications of business cycles on the strategic management of the firm (Amit and Livnat, 1988; Ruefli and Wilson, 1987).

However, these streams of research allow us to draw two conclusions relevant to strategic management. First, in the aggregate, strategic actions of firms have been shown to be affected by the business cycles (Zarnowitz, 1985). For example, during the period of recovery, unemployment levels begin to fall, capacity utilization rises along with employment productivity, low inventory levels begin to rise with the advent of unfulfilled orders, and investments in fixed capital increase relative to prior levels. However, the breadth of management decisions explored by most empirical studies has been limited to production processes (e. g. , inventory levels, capacity utilization.) and wage levels. Less attention has been directed to areas of R&D, product quality, and vertical integration, where decisions have been shown to influence business profitability (Buzzell and Gale, 1987). Thus, it appears worthwhile to explore the impact of a larger set of strategic decisions on the MS-BP relationship across differing business cycles. Second, the structure of an industry is important for explaining cyclical fluctuations in price--cost margins

(Domowitz et. al. , 1988) since margins within an industry are positively related to concentration in durable and consumer goods industries but not in producer goods industries. Simultaneously, other variations also exist, attesting to the consideration of industry structure in the study of the impact of business cycles on strategic decisions and their consequent effects on market share and profitability.

The above conclusions suggest that the adjustments to the business strategy as it moves through the various stages of business cycles affects both market share and its profitability. Thus, this study is based on a premise that business cycle serves as an important construct in the examination of the relationships among strategy, market share and business profitability.

Arguments from strategic management theory

In that social science research which follows the positivist tradition, confidence in the results of a stream of research develops cumulatively over many studies and across different settings. Indeed, the maturity of a science is often judged by the extent of replication practiced (Dewald, Thursby, and Anderson, 1986; McGrath and Brinberg, 1983). However, much of the descriptive findings (and the consequent normative implications) in strategic management research have been based on cross-sectional studies conducted at *one point in time*. Nearly all researchers call for multi-time period, longitudinal studies, but there are few truly longitudinal studies (see Jacobson and Aaker, 1985; Jacobson, 1988 for some recent attempts at modeling lagged effects). While not designed as a longitudinal study *per se,* we employ a comparative static approach to assess the temporal stability of the nature of the relationship between market share and profitability across two different business cycles. It is thus, an important step in the desired direction of longitudinal exploration.

While much of our understanding of the nature of the MS--BP relationship has been based on two databases (the PIMS program; and the FTC database), individual studies differ in their approach to sample selection, measurement schemes, model-specification and estimation (Jacobson, 1988; Prescott et. al. , 1986). Thus, although generalizations should be limited to a

single time-period[1], there is accumulated evidence to support the following conclusions: (a) the association between MS and BP is *not* universal, namely that it is dependent on the characteristics of the broader environment; (b) the key strategic determinants of MS and/or BP vary across different environmental settings; and (c) a significant portion of the observed MS--BP relationship can be accounted for by strategic-choice variables, implying that the relationship is best understood against a backdrop of the strategic actions undertaken by a business that lead to *both* market share and profitability. However, generalizations of such results should be tempered until temporal replications are carried out. This paper is explicitly predicated on this view.

THEORETICAL MODEL

Given the complex nature of the relationship, it is not surprising that several alternate modeling approaches exist in this stream of research, which can be parsimoniously classified into five models. Table 1 summarizes these five modeling approaches: (a) associational models. (b) predictive models; (c) relative effects models; (d) explanatory models; and (e) lagged effects models.

The objective of this study is to test the stability of the relationship among strategy, MS and BP (across different environments) over two different business cycles. For this purpose, an explanatory model appears most appropriate, and hence the theoretical model presented by Prescott, Kohli, and Venkatraman (1986) -- hereafter PKV -- is selected. Three major reasons underlie this choice: (a) its logic in modeling the relationship between MS and BP within the context of strategic decisions as well as the recognition of the impact of environmental variables through the use of a parsimonious environmental typology; (b) its treatment of market share as a mediator between strategic actions and profitability reflecting the theoretical logic that strategic actions give rise to both market share and profitability within the different environments (also

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[1] The research based on the PIMS database covers a relatively longer time frame (since early 1970s), while the research based on FTC is limited to a narrow time frame, 1975-1977 (see Schmalansee, 1985; Anterasian and Phillips, 1988 for studies of the effects of market share using FTC data).

consistent with Woo, 1987); and (c) its operationalization and testing of the model using the Profit Impact of Marketing Strategy (PIMS) database, which now permits temporal comparisons.

Table 1: Alternate Approaches to Modeling the Relationships Among Strategy, Market Share and Profitability

MODEL	DESCRIPTION	ANALYTICAL METHOD	ILLUSTRATIVE STUDIES
Associational Model	Examination of the correlation between market share and profitability	Correlational Analysis	Schoeffler et. al. (1974) Buzzell et. al (1975)
Predictive Model	Assessment of the predictive role of MS; identification of key determinants of MS, and Δ MS	Multiple Regressions	Woo & Cooper (1982) Woo (1981) Buzzell & Wiersema (1981)
Relative Effects Model	Identification of the relative effects of industry, firm, and MS on firm profitability	Stepwise Regressions	Schmalansee (1985)
Explanatory Model	Decomposition of the association between MS and profitability into various theoretically relevant components	Path Analysis; Structural Equations	Phillips et. al (1983) Prescott et. al (1986) Woo (1987)
Lagged Effects Model	Assessment of the time-lagged effects of MS on profitability	Multiple Regressions	Jacobson & Aaker (1986); Jacobson (1988)

The theoretical model specifies a *direct* effect of MS on BP as well as possible *spurious* effects (implying that a common set of antecedent factors, such as strategic decisions giving rise to both MS and BP). Thus, MS acts as the mediator between strategy and business profitability. The operational path-analytic model with sixteen antecedent strategy variables is presented in Figure 1. As in the original study, the model used here is estimated separately within each homogeneous environment, such that the results can be directly compared across the two studies. The original study used the 1976-1979 time-period, while this study considered the 1980-1983 time-period because of its distinctly different macroeconomic characteristics.

(INSERT FIGURE 1 ABOUT HERE)

Research Questions

Although there are powerful logic from both macroeconomic theory as well as strategic management to consider the role of business cycles in the nature of relationship among strategy, MS and BP, the state of knowledge is not as developed to derive precise hypotheses. Thus, the testing approach of temporal stability is exploratory (rather than confirmatory), in the form of a null hypothesis as follows:

> H_0: The pattern of relationship between MS and BP will be *invariant* across different macroeconomic cycles.

If this hypothesis is not rejected, then temporal stability is achieved. If on the other hand, it is rejected, then the pattern of differences will be interpreted in the light of received theories from relevant disciplines to explain the dominant patterns of differences across business cycles.

The temporal stability of the nature of MS--BP relationship in different macroeconomic conditions is addressed through *three* specific questions:

> **Question 1**: What is the extent of stability in the strength of the observed association (correlation) between MS and BP across the different environments?
> **Question 2**: What is the stability of the relative roles of direct and spurious effects across the different environments? and
> **Question 3**: What is the stability in the set of strategic decision variables contributing significantly to the spurious component of the relationship?

RESEARCH DESIGN

Data

The PIMS research database provided data for this study. As noted earlier, the choice is guided by the consideration that it was used for the PKV study as well as other prominent studies focusing on this relationship[2]. More importantly, it is appropriate for the research objectives since it contains relevant data on a variety of environmental, strategic, and performance variables for over 2000 individual strategic business units (SBUs) over time. A variety of strategy research questions have been examined using this database (Buzzell and Gale, 1987; Ramanujam

[2] It is worth noting that the FTC data does not provide the opportunity to explore multi-period examinations of this relationship.

and Venkatraman, 1984), but its limitations are to be recognized (Scherer, 1980). Several examinations of the data quality over time (Phillips, Chang, and Buzzell, 1983; Marshall, 1987) provide support for the contention that the quality and reliability of the data is adequate for research.

Constructs and measures

***Favorable* and *Unfavorable* macroeconomic periods.** The design of this study required the identification of two four-year time periods, which did not overlap and differed significantly in their macroeconomic conditions. One constraint for the design was that the PKV study used the four-year averages within the PIMS database for the period, 1976-1979. According to the US Department of Commerce, *Business Conditions Digest* (1986), the 1976-1979 period can be termed as a period of *expansion*. The subsequent four-year period, 1980-1983 represents a mixture of both contraction and expansion. For instance, the periods from January to July 1980 and July 1981 to November 1982 were classified as *contraction* (or, unfavorable) periods, while the time periods defined from July 1980 to July 1981 and November 1982 through December 1983 were classified as *expansion* (or, favorable) periods.

While the 'ideal' sampling plan would have conformed to the strict definitions of 'expansion' and 'contraction' periods, the constraints of the study (given the need to link it to the earlier studies) and the database prohibited this type of sampling. A 'second-best' solution, however, is achieved if we examine Table 2 that presents several broad indicators of the two time periods. The data is drawn from studies conducted by the National Bureau of Economic Research (NBER) and reported by the *Business Conditions Digest* (1986). If we note that the traditional measure used to define periods of contraction and expansion is the percent change in real GNP growth, then some important patterns emerge from Table 2. The set of indicators reveals differences in the general economic conditions (real rate of GNP growth %; inflation, interest rate, as well as profit figures) between the two periods. For example, the real growth of GNP during the first period was consistently positive (ranging from a low of 2. 5% to a high of 5. 3%), while in the second period it was both positive and negative (from a low of (-) 2. 5% to a high of 3. 6%).

Similarly, the first period had predominantly single digit inflation, while the second period had much higher two digit-inflation. The average percent of real GNP growth in the PKV study was 4. 4%, well above the 0. 7% for the subsequent four years. Additionally, the average inflation rates, interest rates, profit before taxes as a percentage of assets, and return of equity all conform to expectations. Thus, for the purpose of this research, the 1976-1979 time period (PKV Study) will be considered as the 'favorable' phase of the business cycle, while the subsequent period, 1980-1983 will be termed as the 'unfavorable' phase of the cycle.

Table 2: Selected Economic Indicators: US Economy (1976--1983)

STUDY	Time	GNP ($bil) Current$	GNP Real Growth %	Inflation %	Int. Rates %[a]	PBT/Assets %[b]	ROE (Mfg)
PKV Study	1976	1783	4. 9	5. 8	5. 5	16. 1	14. 0
(1976-79)	1977	1991	4. 7	6. 5	5. 7	16. 5	14. 2
	1978	2250	5. 3	7. 7	7. 7	17. 4	15. 0
	1979	2508	2. 5	11. 3	9. 8	18. 1	16. 5
	AVERAGE		**4. 4**	**7. 8**	**7. 2**	**17. 0**	**14. 9**
This Study	1980	2732	(-) 0. 20	13. 5	10. 9	15. 2	13. 9
(1980-1983)	1981	3053	1. 90	10. 4	13. 1	14. 7	13. 6
	1982	3166	(-) 2. 50	6. 10	11. 07	9. 5	9. 3
	1983	3402	3. 60	3. 20	8. 80	11. 3	10. 5
	AVERAGE		**0. 70**	**8. 30**	**10. 98**	**12. 7**	**11. 58**

a -- Based on 1-Year Treasury Bills;
b -- Manufacturing Sector Only.
Source: US Bureau of Census, Statistical Abstract of US. , 1987. 107th Edition, Washington, DC.

Consequently, the selection of the sample followed the same procedure as in the PKV study. All businesses in the PIMS data base which contained four years of data ending over the 1980-83 period were selected. The values of the variables were averaged over four years to reduce the effect of any non-recurring influences. A total of 899 SBUs served as the sample. The reduction in the size of the sample relative to the PKV study (n=1638) was indicative of changes in the size and composition of the PIMS data base over the past 15 years.

Development of Homogeneous Environments. In order to examine the nature of the relationship between MS and BP across different environments, an operational typology of environments is necessary. The PKV study utilized a typology of eight environments that was developed through cluster and discriminant analysis of seventeen environmental variables. The discriminant functions developed in the PKV study were used to classify each of this study's sample businesses into one of the eight environments. These functions assign a probability estimate for each business indicating the likelihood that the business belongs to a particular environmental group. Seventy-eight business units were dropped from further consideration because their probability of being classified into any particular environment was less than . 50. This criterion ensured that the business units within an environment were relatively homogeneous with respect to their values across the set of 17 environmental variables. Of the 821 remaining business units, the average likelihood probability of being assigned to a particular environment was . 88, with a range of . 76 to . 99. These 821 business units served as the sample domain. The steps involved with the development of this study's sample as well as a comparative profile of the environments are provided in Appendix 1.

A comparison of the environmental characteristics for the two samples indicates several significant changes. The sample in 1980-83 period experienced a sharp rise in the total share instability of businesses, a rise in wage rates, and the businesses were slightly further along in their product life cycles. In addition, real market growth, the importance of auxiliary services to end users, the purchase frequency of end users and minimum capacity investment required for a business significantly declined. These changes generally have face validity, given the general economic trend during the 1980-83 period, and they also reflect the changing composition of the PIMS data base. However, they must be interpreted with caution since these comparisons reflect changes in the overall samples for the two periods and are not necessarily consistent with the pattern within any individual environment, a situation which will be discussed below.

Specification of strategy variables. Our view of strategy is that it is a *pattern* of resource allocations to key areas, and accordingly is represented as a vector of scores along

sixteen variables[3] . This representation is analogous to Anterasian and Phillips (1988) view of strategy as the approach adopted by a business to deliver value to its customers relatively better than its competitors as well as Woo's (1987) specification. Thus, our view is that the scores along these variables collectively define and describe strategy, although their relative role in influencing MS and BP may vary across environments and time periods. In other words, some strategy variables (such as the degree of vertical integration or relative price) may be critical in some environments and not in others, but the same set is used in all the environments to isolate their relative roles. The selection of the specific set of sixteen strategy variables is consistent with the PKV study as well as other strategy research studies using this database (Buzzell and Gale, 1987; Hambrick, 1983; Prescott, 1986).

Dependent Variable(s). In line with the theoretical model, the ultimate criterion variable is business profitability, represented as ROI. It is a widely used measure of profitability in this stream of research (Buzzell and Gale, 1987) as well as in the larger stream of strategy research (Hofer, 1983). In addition, it is strongly correlated with other relevant performance measures such as return on sales (r=0. 85) within this database (Buzzell and Gale, 1987). Further, as specified in the theoretical model, MS serves as an intermediate dependent variable impacted by the sixteen strategy variables, and as an independent variable affecting ROI.

Analytical Procedure

The analytical procedures for this study involves (a) estimation of the zero-order correlation between MS and ROI within each environment; (b) examination of the relative magnitude of direct and spurious effects within each environment; (c) identification of the significant antecedents of the analyzed spurious relationship; and (d) comparison of the results of the above three steps with the PKV study.

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[3] See Figure 1 for the list of variables, whose definitions are as per the PIMS program (see for instance, Prescott et al., 1986; pp. 392-393).

Logic in the Decomposition of Correlation. Following Duncan (1971), and Alwin and Hauser (1975), the general decomposition equation underlying the theoretical path-analytic model can be represented as:

$$r_{MS-BP} = \text{Direct Effect} + \text{Analyzed Spurious Effect} + \text{Unanalyzed Spurious Effect} \quad (1)$$

The components of equation (1) were estimated using five steps. The *first* step involved examining whether or not the correlation between MS and ROI was statistically significant. If the correlation was not significant in any particular environment, further attempts to decompose a near-zero correlation were unwarranted. The *second* step involved performing two sets of ordinary least squares (OLS) regressions. In the first set, ROI was used as the dependent variable, and the sixteen strategy variables and MS were treated as independent variables. In the second set, MS was used as the dependent variable, and the sixteen strategy variables were treated as the independent variables. The standardized beta values obtained from the regressions represent the coefficients of direct paths from each independent variable to the dependent variable. In the *third* step, the correlation between MS and ROI was decomposed into direct and spurious components as indicated by equation (1), using the results from the second step. In addition, the total spurious relationship was decomposed into its two components -- analyzed and unanalyzed -- based on the following equation (2):

$$SR = \sum_{i=1,16} p_{MS.X_i} \cdot p_{ROI.X_i} + \sum_{i=1,16} p_{MS.X_i} \left[\sum_{\substack{j=1,16 \\ i \neq j}} r_{ij} \cdot p_{ROI.X_j} \right] \quad (2)$$

Where SR=Spurious Relationship; MS=Market Share; ROI=Return on Investment; r=Correlation Coefficient; and X_i = Strategy Variables (i=1,16).

The *fourth* step entailed the calculation of the ratio of total spurious relationship accounted for by a set of strategy variables (SR) to the total association (r) -- SR/r ratio. This ratio indicated the extent of spuriousness within each environment. In addition, the statistical significance of the performance effects of the strategy variables acting through market share is also assessed. If the indirect effect was not significant, the implication is that there is no mediational

role for MS, and that the relationship between strategy and profitability is largely explained by the direct effects. If on the other hand, there is no significant direct effect, then it implies support for a complete mediation model -- enhancing the role of MS in this set of relationships. The *fifth* step involved identifying the strategy variables -- which account for a major portion of the analyzed spurious relationship. In each environment, the top five variables contributing to the analyzed spurious relationship were considered important for the purpose of discussion and comparisons (with the PKV study).

Assessment of Temporal Stability. For addressing the three research questions, the results obtained in this study were systematically compared with corresponding results from the PKV study using both quantitative (i. e. , statistical) and qualitative criteria. The stability in the magnitude of correlations (question 1) was assessed statistically using a t-test of the difference in the magnitude of the two correlations. The stability in the roles of direct versus spurious effects (question 2) was assessed statistically using a test of proportions of the values representing the analyzed component of the spurious relationship, while the stability in the set of variables significantly contributing to the analyzed spurious relationships (question 3) was assessed qualitatively by examining the composition of the variables in the two sets.

RESULTS AND DISCUSSIONS

Differences in Samples

Before proceeding with the detailed evaluation of the impact of business cycles on the relationship between market share and profitability, it is important to ascertain if there are basic differences in the sample characteristics across the two phases. To explore this issue, t-tests were used to compare the values of the seventeen environmental variables for each environment across the two time periods. Significant differences ($p<.05$) for the 1980-83 sample as compared to the 1976-79 sample for each environment are noted below.

Comparison of Characteristics. In the *mature* environment, there were three significant changes: total share instability rose, long-term industry growth declined, and material

cost growth declined. In the *declining* environment, total share instability, wage rates, and long-term industry growth rose, while minimum capacity investment fell. The *fragmented* with auxiliary services environment experienced increases in wage rates, industry productivity, and the stage in the product life cycle, while real market growth and the frequency of product changes declined. The *stable, non-fragmented* environment had a decline in real market growth and increases in industry exports, imports, wage rates, and the stage of the product life cycle. The values for the *fragmented, standard product* environment rose for industry concentration, product life cycle, and total share instability. The *global exporting* environment had decreases in exports, minimum capacity investment, and the importance of auxiliary services to end users. The *global importing* environment differed only in that there was a rise in total share instability. Finally, in the *emerging* environment, total share instability rose, while long-term industry growth, real market growth and the importance of auxiliary services to end users declined.

The comparison of the two samples reveals several important points. *First*, the environments across the two time periods are fundamentally the same. While there are some changes in the pattern of variables within a particular environment, the fundamental character of the environments remain. The high levels associated with the probability estimates for the discriminant functions further supports this conclusion. *Second*, the environments are not equally affected by the changes in the macroeconomic conditions. A total of thirteen environmental variables were found to be significantly ($p < .05$) different across the eight sets of environments. Any one environment did not have more than five significant variables with the mode being three. *Finally*, the environmental conditions for the sample of businesses in the data base appear to be maturing. More businesses have lower industry growth and products in the later stages of the product life cycle in the 1980-83 sample than for the 1976-79 sample. The relative impact of the last two points for the composition of the environments is difficult to assess. However, there does *not* appear to be strong evidence to suggest that the samples are fundamentally different.

Comparison of the Sizes of Environments. In general, the *relative* sizes of the two environments are maintained in the two samples. The most noticeable exception was the

declining environment which comprised 32% of the sample in this study while comprising 20% in the PKV study. In two environments -- global exporting and global importing -- the samples were too small for meaningful regression analyses, and hence excluded from further analysis. However, the proportion of businesses across the different environments in the PKV study and in this study for these two environments were very similar. Thus, the research questions were studied for six environments and the total sample.

Question 1: Stability in the Strength of Association Between MS and ROI

Table 3 summarizes (a) the correlations between MS and ROI in each of the six environments and the total sample; (b) corresponding results from the PKV study; and (c) the t-test of the difference in the magnitude of correlations across the two studies. Two conclusions can be drawn from this table. First, the correlations between MS and BP in this study are positive and statistically significant in all the environments as well as in the total sample, although their magnitudes differ. This is consistent not only with the PKV study, but also with a larger body of research that reports a generally positive association between MS and ROI. The second conclusion is more important as it pertains to the temporal stability of the *strength* of the correlations for each environment across the two studies. It was found that the strength of the association was not statistically different from corresponding correlations in the PKV study (1976-1979 period) given that *none* of the seven t-statistics emerged as significant.

The implication of this result is that the general pattern of correlations between MS and ROI differs *across* the environments *within* both samples, lending further support to the context-specificity of the MS--BP relationship. More importantly, the temporal stability across the two samples is maintained, indicating that if macroeconomic influences are at work, they are not reflected in the cross-sectional correlations. In other words, we see more pronounced differences *across environments within a time period, than within-environments across time-periods.*

Table 3: Stability in the Strength of Association Between MS and ROI

	PKV Study		This Study		t-statistic For
Environment	n	(r)	n	(r)	Diff in (r)[a]
Mature	127	0. 422***	76	0. 435***	0. 122
Declining	323	0. 348***	264	0. 359***	0. 132
Frag. w/aux. services	376	0. 338***	133	0. 290***	0. 481
Stable	402	0. 252**	150	0. 184*	0. 757
Frag. std. products	88	0. 303**	44	0. 411***	0. 663
Global exporting	93	0. 351***	18[b]	na	na
Global importing	62	0. 088	19[b]	na	na
Emerging	167	0. 191*	117	0. 240**	0. 435
TOTAL	1638	0. 300***	821	0. 324***	0. 514

*** -- p<. 001; **-p<. 01; *-p<. 05.

a- Based on the differences in two independent correlations (Bruning and Kintz, 1987);

b -- Due to small samples relative to the number of explanatory variables, regression runs could not be performed; and hence, excluded from the analysis. The total sample is reduced accordingly.

Question 2: Stability in the Relative Roles of Direct versus Spurious Relationships

Given statistically significant correlations between MS and ROI, it is necessary to examine the *nature* of the relationships -- i. e. , direct and/or spurious. The regression results for the two sets of calculations for path analysis are used for decomposing the correlation between MS and ROI into the various components of equations (1) and (2), as summarized in Table 4 (detailed regression results are presented in Appendix 2 along with the t-statistics for testing the significance of indirect effects of each strategy variable through MS). This table also presents the statistical test of the difference in the proportion of the spurious relationship to the total association (SR/r) across the two time-periods.

Table 4: Decomposition of the Association Between MS and ROI: Direct Versus Spurious Effects

	This Study							PKV	Test of Diff
Environment	N	Corr MS-ROI	Direct Effect	Anal. Spur	Unanal. Relationship	Total	SR/r	SR/r %	In % SR/r
Mature	76	.4348**	0.271	0.207	(-).043	0.164	37.67	47.86	1.41
Declining	264	.3586**	0.194	0.123	0.042	0.165	45.90	51.50	1.35
Frag. w/aux serv.	133	.2895**	0.118	0.128	.044	0.172	59.24	37.87	4.27**
Stable	150	.1839*	0.021	0.192	(-).030	0.163	88.58	61.11	5.24**
Frag. w/std. prds	44	.4113**	0.533	(-).123	0.001	(-).12	29.6	62.37	3.55**
Emerging	117	.2405*	0.052	0.179	0.010	0.189	78.38	70.68	1.45
TOTAL	821	.324**	0.175	0.137	0.012	0.15	46.0	55.3	4.35**

** - p<.01; * - p <.05.

Table 4 provides the basis for one interesting conclusion: across the two samples, the proportion of the analyzed spurious component differs statistically in four of the seven cases -- with two increases and two decreases. It is worth recalling that the proportion of analyzed spuriousness signifies the importance of strategic decisions that result in both market share and business profitability. For two of the environments -- fragmented with auxiliary services and the stable, non-fragmented environments -- the proportion of the analyzed spurious component increased in the unfavorable macroeconomic time period of 1980-83. In these two environments, the shift in the macro environment increases the role of strategy variables. The implication is that strategy variables explain a greater portion of the observed MS--BP relationship. In the fragmented, standard products environment and the total sample, the proportion of the analyzed spurious component decreased over the same period. In these cases, maintaining market share appears to be more critical than changes in strategy variables for maintaining high profitability. Overall, it is worth noting that approximately 50% of the correlation between MS and BP is explained by the strategy variables specified in the model.

An additional implication is that given the same set of variables, their role in serving as antecedents for influencing MS and ROI differs across the two macroeconomic time periods. As

detailed in Appendix 2, in the overall sample, seven out of sixteen indirect effects (of strategy through market share) are statistically significant implying the existence of strong mediational effects through market share. The implication is that Additionally, there are interesting but differing patterns of mediational effects in the different environments. Since the PKV study did not discuss the mediational effects, a direct comparison is not possible. However, an interesting question is whether stability exists in the set of variables that contribute significantly to the analyzed component of spuriousness. This is addressed next.

Question 3: Stability in the Set of Strategy Variables Contributing to Spuriousness

Table 5 summarizes the list of strategy variables contributing significantly to the analyzed part of spuriousness within each environment in this study as well as the PKV study. Within each environment, the top five variables are listed. In the total sample, four of the top five variables are stable, while in other cases, there seem to be varying degrees of fluctuations -- ranging from two in three of the environments to four in the case of declining and stable environments.

Table 5: Stability in the Set of Significant Variables Contributing to the Analyzed Component of Spuriousness

Environment	PKV Study	This Study	Common Variables
Mature	X13,X10,X12,X14,X2	X3,X13,X11,X16,X14	TWO (X13,X14)
Declining	X3,X7,X10,X13,X16	X7,X13,X3,X10,X12	FOUR (X3,X7,X10,X13)
Frag w/aux services	X3,X14,X11,X16,X18	X3,X4,X7,X10,X11	TWO (X3,X11)
Stable	X13,X11,X3,X10,X2	X3,X13,X10,X15,X16	FOUR (X3,X10,X11,X13)
Frag w/std. products	X3,X13,X11,X6,X7	X12,X3,X11,X15,X16	THREE (X3,X11,X16)
Emerging	X3,X11,X15,X16,X10	X7,X3,X11,X13,X16	FOUR (X3,X11,X13,X16)
TOTAL	X3,X11,X13,X16,X10	X7,X3,X11,X13,X16	FOUR (X3,X11,X13,X16)

(Note: For explanations of the notations for Xs, see Figure 1.)

A close examination of Table 5 reveals several patterns. The set of sixteen variables can roughly be grouped into those reflecting an emphasis on *costs* (e. g. , manufacturing

expenses/revenue) and those oriented toward *differentiation* (e. g. , product quality). In five of the six environments, investment intensity, a cost variable, is common across the two time periods. Only in the mature environment during the 'favorable' macroeconomic period was investment intensity not among the top five variables accounting for the spurious component of the relationship between MS and BP. In four of the six environments, product quality, a differentiation variable, was common across the time periods. Relative product breadth, which can be viewed as an attempt to differentiate one's product line, was common in the declining and stable, non-fragmented environments. However, narrowing the relative product breadth in both cases was critical for high performance in the 'unfavorable phase'. In many ways, this can be viewed as an attempt to cut costs in the unfavorable phase.

Within a particular environment there appears to be a pattern for the variables that are common across the macroeconomic periods. Of the sixteen strategy variables, eleven (65%) were related to cost emphasis. If the relative product breadth variable, which shows a narrowing in the unfavorable period is included, then the total is twelve of sixteen. Thus, *changes* in the set of strategy variables contributing to the spurious component of the MS-BP relationship over the two time periods are, to a greater extent, attributable to differentiation-type variables than cost variables.

Temporal Stability: An Overall Assessment

Collectively, it appears that there is stability in the nature of relationship between MS and BP across the two time-periods, although they are marked by significant differences in macroeconomic conditions. While we do not claim to have identified any 'law-like' relationships that are intrinsically stable, we are gratified by the general pattern of stability in the results. It is particularly important that the pattern of correlations between MS and ROI was identical (in a statistical sense), and that a significant portion of the association could be explained by the analyzed component -- strategic decision variables. Further, while there was general consistency in the strategy variables contributing to the analyzed component of spuriousness, there was some variation (e. g. , differences in the emphasis for differentiation-oriented strategies) to warrant more focused research studies. This set of results reinforces the need to identify critical strategy variables

relevant for each environment and to concentrate on those areas, making only *minor* strategic adjustments for shifts in macroeconomic conditions rather than major shifts in strategic resource deployments. An important area of extension is to develop more finely-calibrated constructs and develop hypotheses pertaining to differential effects across macroeconomic conditions.

Limited generalizations across the two studies

1. Positive association between MS and ROI. It is clear that there is a positive and significant *association* between MS and ROI. This seems to be borne out in nearly all the studies that have examined this relationship. This is particularly true of the PKV study and this study, where nearly all (except global exporting environment in the PKV study) the observed correlations are positive and non-zero, both in the individual environments as well as in the overall sample, and across time. Thus, we can perhaps take this to be a 'law-like' empirically-observed relationship and direct future research efforts at understanding the theoretical reasons underlying the differences across different contexts as well as arriving at a richer theoretical model that explain the *components* of this association in the light of various theories or explanations.

2. Context-specificity of the relationship between MS and ROI. This is a logical extension of the first in the sense that the strength of the positive association did not remain the same across the different environmental contexts. The implications is that, while we know that there is a base-level of positive, non-zero effect, the range of the degree of association is quite large, suggesting that this relationship is context-specific. In the PKV study, the values of the significant correlation coefficient ranged from a low of 0. 191 in the emerging environment to a high of 0. 422 in the mature environment. This is consistent with the received wisdom that the relationship between MS and ROI is unlikely to be strong in the initial stages of the product life cycle and that it is most pronounced in the later stages as the product matures and the level competition reaches a steady-state equilibrium condition. In this study, a similar pattern exists. The emerging environment had the second-lowest value of correlation between MS and ROI (r=0. 240), while the mature environment had the highest (r=0. 435). This argues for the need to

develop mid-range modeling of strategies and effectiveness, thereby formally recognizing the influence of macro environmental characteristics.

3. Significant spurious component explained by strategic decisions. If we accept the premise that the strategy variables selected in the model are relevant for strategic management, then an important finding is that a significant portion of the 'spurious' relationship between MS and ROI is accounted for by the strategy variables. In the PKV study, the proportion ranged from a low of 37. 87% in the fragmented with auxiliary products environment to a high of 70. 68% in the emerging environment, and the average value across all environments in the PKV study was 55%. In this study, the lowest value was 29. 6% (absolute) in the fragmented with standard products environment and the highest was 88. 58% in the stable environment with an average of 46%. Thus, it is clear that we have been able to isolate a significant set of antecedent strategy variables that explain the relationship between MS and ROI as being the key antecedents (also consistent with Buzzell and Gale, 1987). Cost-related strategy variables play an increasingly important role in unfavorable macroeconomic conditions, while differentiation-related variables take on different roles during the two periods.

4. Modeling MS--ROI relationship in its organizational, environmental, and temporal contexts. A major implication is that future research on the relationship between MS and ROI should explicitly move away from simple associational models toward a more comprehensive specification of the nature of the relationship between MS and ROI not only in its organizational and environmental contexts, but also in its temporal contexts. Based on the available evidence to date, it is clear that the correlation between MS and BP is meaningless unless related to the specific environmental context, the strategies pursued, as well as the particular macroeconomic conditions. These should be explicitly reflected in the design and execution of studies. Future theoretical work should focus on developing appropriate models that reflect this level of complexity.

5. The treatment of market share as a *mediator* between strategy and performance. The specification of the role of market share in equations (or relationships) has been fuzzy in strategy research. Market share has been used as an *independent variable* (i. e. , representing "strategy") that predicts performance (Buzzell et. al. , 1975; Henderson, 1979), as a *mediator* between strategy and performance (Prescott et. al. , 1986; Woo, 1987), as the *criterion* variable (Zeithaml and Fry, 1984) as well as in a simultaneous equation model as both predictor and criterion (Schendel and Patton, 1978). We argue that market share should be best viewed as a *mediator* between strategy and performance, since its use as an independent variable underplays the role of strategy, and its use as a dependent variable assumes deterministic links to business performance that have been shown to be unwarranted.

CONCLUSIONS

This paper began with a premise that it is important to test the temporal stability of the much-researched relationship between MS and ROI across differing business cycles. Hence, it tested the stability of the relationships reported by Prescott, Kohli, and Venkatraman (1986) in an economically different four-year time period. The results are generally stable, attesting to the intrinsic stability of the nature of the relationship, although some interesting differences did emerge with significant implications for theory and practice of strategic management.

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Appendix 1: Development of Environments

The empirical development of homogeneous environments builds on the approach adopted by Prescott, Kohli, and Venkatraman (1986) in the sense that it is based on seventeen market structure characteristics. While the PKV study employed cluster and discriminant analysis, this study employed the discriminant scores from the PKV study for assigning a business unit into a particular environment. The detailed steps are outlined below.

Step 1: Obtain the discriminant functions used in the PKV study.

Step 2: For each of the 899 businesses (using the discriminant functions, generate the likelihood probability estimates of the eight environments.

Step 3: Classify each business into one environment. For a business to be classified into an environment, a criterion was developed which specified that the value of the likelihood probability estimate for a particular environment must exceed . 50. This criterion helped to ensure that the values for the environmental variables for the set of businesses were homogeneous within the environments and heterogeneous across environments. Based on this criterion, 78 businesses were dropped from the sample, resulting in a final sample of 821.

The accompanying Table (A1) contains the values of each of the seventeen variables for the eight environments for 1976-1979 period, and the Table (A2) contains corresponding values for the 1980-1983 period.

Table A1: Summary of the Competitive Environments (1976-1979)

ENVIRONMENTS	Total Sample	Global Exporting	Fragmented Std. Product	Stable Non Fragmented	Frag. W/ Aux.Serv	Emerging	Mature	Global Importing	Declining
VARIABLES									
Industry Concent.	56.61	64.17	44.4 *	58.74	45.38 *	58.40	68.11 *	74.35 *	60.35
Life Cycle Stage	2.81	2.58 *	2.89	2.68	2.91	2.45 *	2.91	2.81	3.05 *
Tot. Share Instab	12.85	13.93	13.23	10.25*	11.59	18.18	12.72	12.79	14.03
LT Ind. Growth	9.08	12.34*	8.81	7.99	7.54	13.71*	12.54*	11.43*	7.21
Ind. Exports	7.31	30.53*	3.63 *	4.67	9.09	4.80	6.61	6.05	4.82
Ind. Imports	4.80	5.04	4.53	2.22	5.23	3.18	4.05	30.71*	3.82
Mat. Cost Growth	9.32	9.40	6.66	10.16	7.54	6.79	19.65*	9.69	8.56
Wage Rate Growth	8.59	7.85	8.28	7.38	7.59	9.04	16.89*	9.32	8.00
Min. capacity Inv	17.86	23.23	11.08	15.77	16.20	14.25	25.54	16.41	21.82
Real Mkt. Growth	4.26	10.4*	2.04	3.65	1.32	18.9 *	0.23	4.64	0.79
Ind Val.add/employee	25.85	25.85	24.10	26.57	21.28	23.48	28.02	24.13	31.75*
% emp. unionized	42.42	33.44	38.01	46.25	33.38	26.75*	57.95*	51.57	52.92
End-user fragment	20.85	20.17	36.22*	10.04*	29.68*	23.04	19.56	21.98	20.68
Pur.Freq-End-user	3.37	3.73	4.46 *	2.56 *	4.54 *	4.07 *	3.00	3.57	2.44 *
Freq. prod. change	3.71	3.68	1.53 *	3.84	3.82	3.65	3.88	3.84	3.92
Dev.Time -New Prod	2.86	2.72	2.39	2.25 *	2.89	2.38 *	2.73	3.24	3.98 *
Import. of Aux.Serv	1.03	1.54 *	0.77	1.01	1.46	1.32	0.87	1.06	0.41 *
Sample Size	1638	93	88	402	376	167	127	62	323

* p<.01 from the mean for the sample.

Table A2: Summary of the Competitive Environments (1980-1983)

ENVIRONMENTS	Total Sample	Global Exporting	Fragmented Std. Product	Stable Non Fragmented	Frag. W/ Aux.Serv	Emerging	Mature	Global Importing	Declining
VARIABLES									
Industry Concent.	58.25	60.11	53.77	61.18	49.00*	57.51	65.53*	67.53	59.79
Life Cycle Stage	2.90	2.83	3.00	2.84	3.03*	2.60*	2.87	3.05	3.01*
Tot. Share Instab	23.09	16.39*	20.97	8.80*	11.52*	67.47*	17.16*	30.84	22.57
LT Ind. Growth	8.80	9.71	10.30	8.55	7.71*	9.93*	9.53	8.23	8.44
Ind. Exports	6.81	25.37*	3.89*	6.51	8.29*	6.04	6.96	6.40	5.86*
Ind. Imports	4.76	3.17	5.56	3.98*	4.24	4.15	4.61	29.53*	4.15*
Mat. Cost Growth	8.59	7.38	8.87	8.98	7.15	8.14	11.80*	7.41	8.36
Wage Rate Growth	9.48	8.09*	9.50	8.17	8.27*	9.41	17.19*	9.23	8.83*
Min. capacity Inv	15.19	12.89	17.16	14.80	13.14	11.19*	20.23	12.84	7.07
Real Mkt. Growth	1.29	7.44	1.82	0.14	-2.3*	13.28*	0.22	1.34	-0.79*
Ind Val.add/employee	26.95	24.18	23.03*	26.38	23.57*	26.88	25.60	29.48	29.66*
% emp. unionized	44.34	21.89*	38.96	52.07	31.03*	27.79*	62.39*	40.32	52.30*
End-user fragment	21.79	18.11	32.00*	10.67*	31.35*	23.30	20.48	21.05	21.34
Pur.Freq-End-user	3.18	3.56	4.25*	2.67*	4.72*	3.91*	2.71*	3.05	2.35*
Freq. prod. change	3.68	3.72	1.50*	3.87*	3.65	3.67	3.89*	3.84	3.89*
Dev.Time -New Prod	2.97	3.00	1.98*	2.27*	2.68	2.42*	3.03	3.37	4.00*
Import. of Aux.Serv	0.88	1.17	0.77	1.00	1.41*	1.02	0.80	1.00	0.49*
Sample Size	821	18	44	150	133	117	76	19	264

* p<.01 from the mean for the sample.

Appendix 2:: Path Coefficients and T-tests of the Significance of Indirect Effects through Market Share

ENVIRONMENTS	Mature			Declining			Fragmented with Auxillary services			Stable			Fragmented standard products		
Independent variables	Dependent Variable			Dependent Variable			Dependent Variable			Dependent Variable			Dependent Variable		
	ROI	MS	t(1)	ROI	MS	t	ROI	MS	t	ROI	MS	t	ROI	MS	t
Receivables/ revenue (x1)	-0.113	-0.028	-0.215	0.037	-0.038	-0.654	-0.05	-0.106	-0 928	0.01	0.127	0.2617	0.059	-0 232	-1.133
Tot. Inventory/ revenue (x2)	0.186	0.032	0.2231	-0.013	-0.059	-0 929	-0.102	-0.109	-0 84	0.115	-0.002	-0.022	0.126	-0.185	-0.683
Investment Intensity (x3)	-0.489	-0.178	-1.009	-0.469	-0.052	-0.767	-0.424	-0.068	-0 659	-0.446	-0.125	-0 26	-0.216	-0.193	-0.866
Vertical Integratio backwards (x4)	-0 127	0 157	1.0974	0.046	0.017	0.3134	0.147	0.163	1.1253	-0.161	0.075	0 2564	-0.143	0 059	0.2535
Vertical Integratio forwards (x5)	-0 109	0 087	0.6676	-0.037	0.059	1 0562	-0 027	0.075	0 7746	-0 024	0.055	0.2499	-0.418	0 035	0.1475
Capacity utilization (x6)	-0.08	-0.099	-0.777	-0.052	-0.1	-1.643	0.113	-0.063	-0 661	0 042	0	0	0 02	0 224	1.1745
Employee productivity (x7)	0.123	-0.032	-0.242	0.316	0.204	2.365 *	0.18	0.286	1.29	0.25	-0.012	-0.124	0.077	0.03	0.1239
Relative compensation (x8)	0.227	0.108	0.778	0.064	0.074	1.2483	-0.125	-0.009	-0.085	0.087	-0.081	-0.258	0.174	0.094	0.4817
Percent purchased 3 suppliers (x9)	-0.032	0.138	1.1299	-0.013	-0.028	-0.542	-0.009	-0.133	-1 06	0.149	-0.058	-0.251	0.073	0.036	0.2302
Relative product breadth (x10)	-0.042	0 275	1.8162	-0.074	0.319	2.9237 *	-0.085	0.238	1.2727	0 103	0.276	0 2652	0.014	0.203	1.006
Relative product quality (x11)	0.122	0.377	2.0371 *	0.036	0 157	2 0609 *	0.223	0.242	1 2809	0.069	0.262	0 265	-0.112	0.236	1.1997
Relative price (x12)	-0.107	-0.08	-0.481	0.057	0 256	2.6157 *	-0 039	-0.015	-0 114	0 204	0.11	0 2609	-0.521	0 209	0 9647
Relative direct cost (x13)	-0.393	-0.158	-1.069	-0.142	-0.233	-2.552	-0.037	-0.022	-0.164	-0.265	-0.162	-0.264	0.056	-0 108	-0.528
Manuf. expenses/ revenue (x14)	-0.169	0.135	0.9417	-0.278	0.009	0.145	-0.261	0.046	0.3766	-0.106	-0.059	-0.247	-0.046	-0.177	-0.827
Total R&D expens revenue (x15)	-0.082	0.088	0.7534	0.047	-0 043	-0.736	-0.038	0.092	0.7948	0.224	0 084	0.2583	-0.191	0.119	0.5132
Marketing expens revenue (x16)	-0.369	-0.111	-0.582	-0.178	-0.002	-0.028	-0.162	0.035	0 3644	-0.175	-0.176	-0.263	-0.175	-0.129	-0.639
Marketshare	0.271	-	-	0.194	-	-	0.118	-	-	0.021	-	-	0.533	-	-

(1) t-test for the significance of the indirect effect of the independent variable through market share on ROI.

* - p< 05

This t-statistic is calculated as follows:

$$t = (a_2 . b_1)/\sqrt{b_2^2 . se_{a2}^2 + a_1^2 . se_{b2}^2}$$

where a2 is the coefficient of regressing MS on ROI,
and b1 is the coefficient of regressing the independent variable on MS. SE - standard error of estimates.

Appendix 2:: Path Coefficients and T-tests of the Significance of Indirect Effects through Market Share (Continued)

ENVIRONMENTS

Independent variables	Emerging			Total Sample			
	Dependent Variable			Dependent Variable			
	ROI	MS	t	ROI	MS	t	
Receivebles/ revenue (x1)	0.025	-0.108	-0.522	0.029	-0.021	-0.672	
Tot. Inventory/ revenue (x2)	-0.077	-0.055	-0.376	-0 007	-0 047	-1.206	
Investment intensity (x3)	-0.432	0.04	0.3098	-0.497	-0 064	-1 61	
Vertical integration backwards (x4)	-0.01	0.319	0.5592	0 007	0.081	2.3576	*
Vertical integration forwards (x5)	-0.006	0.024	0.2526	-0.052	0 067	2.01	*
Capacity utilization (x6)	0.124	-0.038	-0.353	0 035	-0.028	-0.891	
Employee productivity (x7)	0 384	0.219	0.5493	0.262	0 173	3.7252	*
Relative compensation (x8)	-0.003	0.08	0.495	0.034	0.032	1.0143	
Percent purchased 3 suppliers (x9)	-0.025	0.126	0.5328	0.01	-0.012	-0.386	
Relative product breadth (x10)	-0.033	0.173	0.5455	-0.042	0.254	4.5486	*
Relative product quality (x11)	0.245	0.205	0.5479	0.122	0.224	4.2079	*
Relative price (x12)	0.137	0.348	0.558	0.057	0.169	3.5057	*
Relative direct cost (x13)	0.057	-0.37	-0.56	-0.113	-0.173	-3.667	*
Manuf. expenses/ revenue (x14)	-0.103	-0.094	-0.496	-0.203	-0.006	-0.171	
Total R&D expenses/ revenue (x15)	-0.021	0.129	0.5281	0.025	0.037	1.0984	
Marketing expenses/ revenue (x16)	-0.503	-0.087	-0.461	-0.234	-0.063	-1.549	
Marketshare	0.052	-	-	0.324	-	-	

* - p< 05

x_1 = Receivables/Revenue

x_2 = Inventory/Revenue

x_3 = Investment Intensity

x_4 = Vertical Integration - Backward

x_5 = Vertical Integration - Forward

x_6= Capacity Utilization

x_7 = Employee Productivity

x_8 = Relative Compensation

x_9 = % Purchased from 3 Suppliers

x_{10} = Relative Product Breadth

x_{11} = Relative Product Quality

x_{12} = Relative Price

x_{13} = Relative Direct Costs

x_{14} = Manufacturing/Revenue

x_{15} = Total R&D/Revenue

x_{16} = Marketing/Revenue

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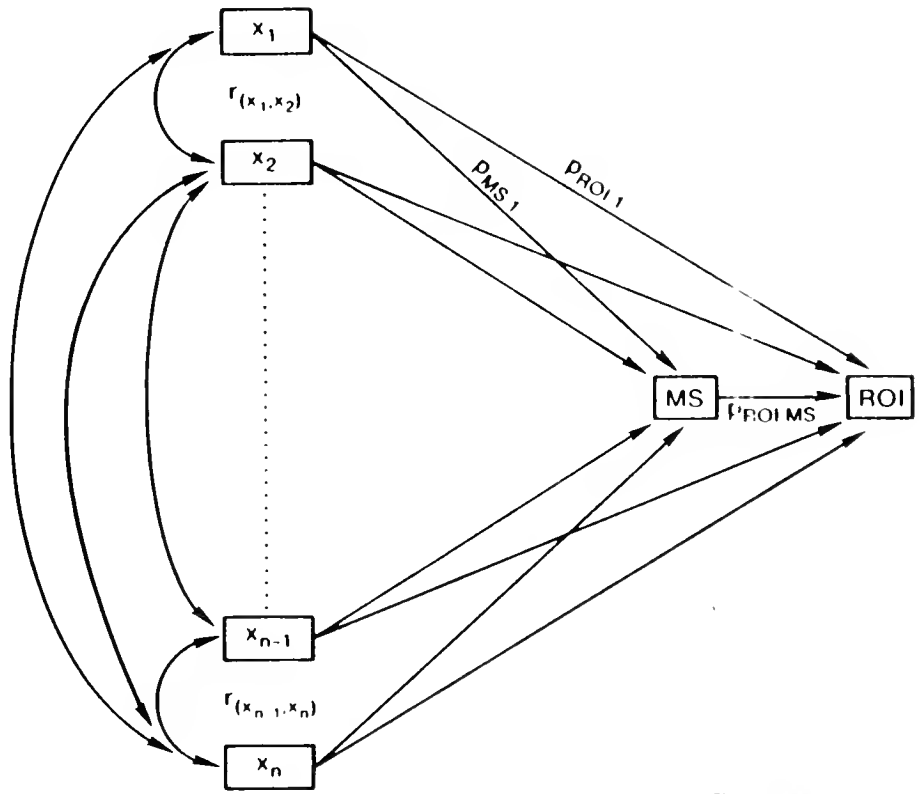

Explanation of the Labels

(x_1 to x_n = Exogenous Variables)

r_{ij} [i=1,15, j=i+1] = Intercorrelations among Exogenous Variables

$p_{ROI.MS}$ = Direct path from Market Share to ROI

$p_{ROI.i}$ (i=1,16) = Direct path from each Exogenous Variable to ROI

$p_{MS.i}$ (i=1,16) = Direct path from each Exogenous Variable to MS

Figure 1. The theoretical model representing causal and spurious relationship between MS and ROI

Date Due

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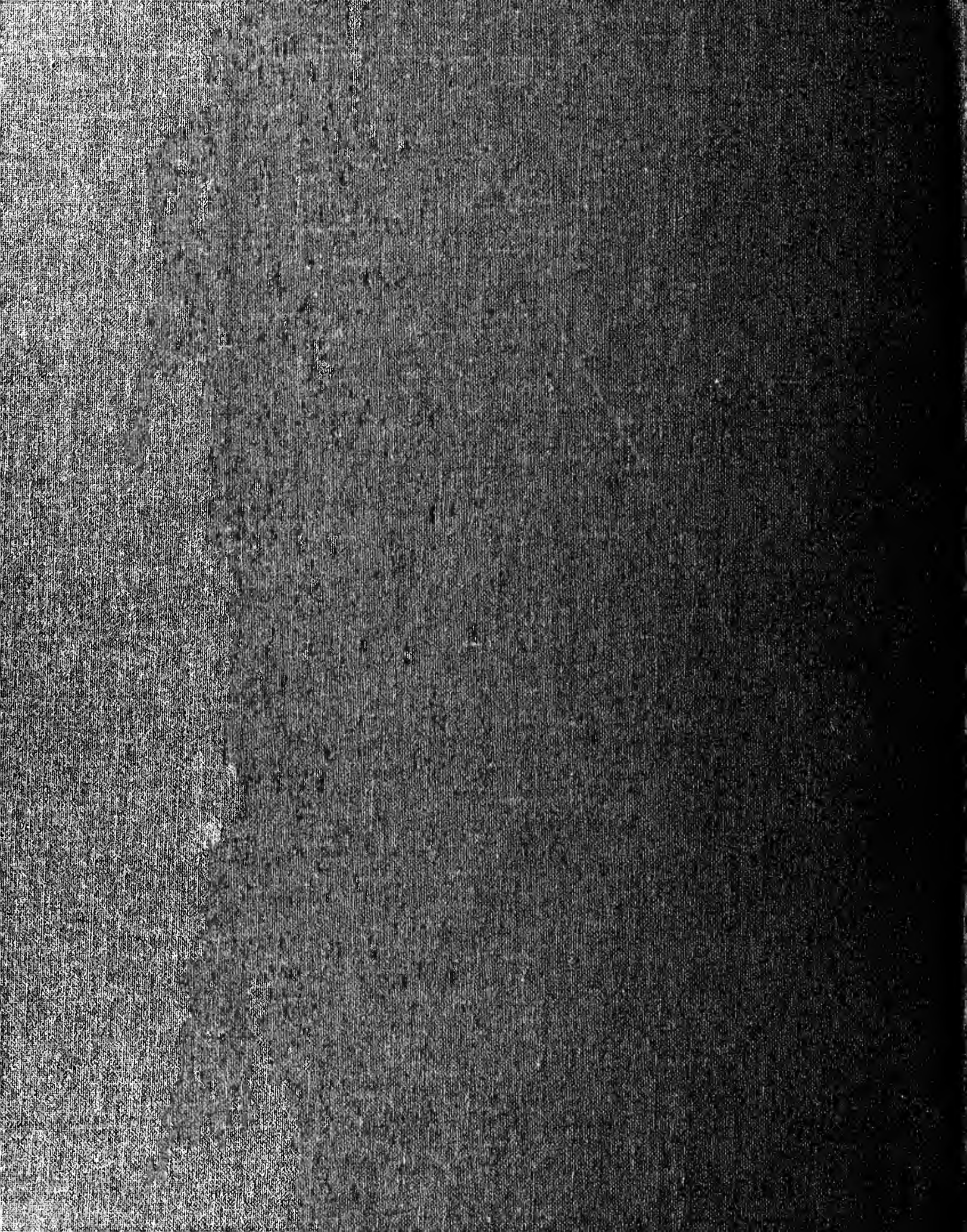
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